

- 17 Hollander F. Laboratory procedures in the study of vagotomy with particular reference to the insulin test. *Gastroenterology* 1948;11:419-25.
- 18 Stempien SJ. Insulin gastric analysis: technic and interpretations. *American Journal of Digestive Diseases* 1962;27:138-52.
- 19 Blackett RL, Johnston D. Recurrent ulceration after highly selective vagotomy for duodenal ulcer. *Br J Surg* 1981;68:705-10.
- 20 Weaver RM, Temple JG. Proximal gastric vagotomy in patients resistant to cimetidine. *Br J Surg* 1985;72:177-8.
- 21 Hansen J, Knigge U. Failure of proximal gastric vagotomy for duodenal ulcer resistant to cimetidine. *Lancet* 1984;ii:84-6.
- 22 Grassi G. A new test for complete nerve section during vagotomy. *Br J Surg* 1971;58:187-9.
- 23 Hoffmann J, Jensen H-E. Failure of proximal gastric vagotomy for duodenal ulcer resistant to cimetidine. *Lancet* 1984;iii:357.
- 24 Hood JM, Spencer EFA, MacRae KD, Kennedy T. Predictive value of perioperative gastric acid tests. *Gut* 1976;17:998-1000.
- 25 Whitfield PF, Hobsley M. Maximal gastric secretion in smokers and non-smokers with duodenal ulcer. *Br J Surg* 1985;72:955-7.
- 26 Debas HT, Cohen MM, Holubitsky IB, Harrison RC. Effect of cigarette smoking on human gastric secretory responses. *Gut* 1971;12:93-6.
- 27 Wilkinson AR, Johnston D. Inhibitory effect of cigarette smoking on gastric secretion stimulated by pentagastrin in man. *Lancet* 1971;iii:628-32.
- 28 Korman MG, Hansky J, Eaves ET, Schmidt GT. Influence of cigarette smoking on healing and relapse of duodenal ulcer disease. *Gastroenterology* 1983;85:871-4.
- 29 McCready DR, Clark L, Cohen MM. Cigarette smoking reduces human gastric luminal prostaglandin E₂. *Gut* 1985;26:1192-6.
- 30 Dorricott NJ, McNeish AR, Alexander-Williams J, et al. Prospective randomised multicentre trial of proximal gastric vagotomy or truncal vagotomy and antrectomy for chronic duodenal ulcer: interim results. *Br J Surg* 1978;65:152-4.
- 31 DeVries BC, Schattenkerk EM, Smith EEJ, et al. Prospective randomised multicentre trial of proximal gastric vagotomy or truncal vagotomy and antrectomy for chronic duodenal ulcer: results after 5-7 years. *Br J Surg* 1983;70:701-3.
- 32 Berstad A, Aadland E, Bjerke K. Cimetidine treatment of recurrent ulcer after proximal gastric vagotomy. *Scand J Gastroenterol* 1981;16:891-6.
- 33 Burge H, Stedeford RD, Hollanders D. Recurrent ulceration after vagotomy and drainage with electrical stimulation test 1957-69. *Br Med J* 1970;iii:373-5.
- 34 Goodman AJ, Kerrigan DD, Johnson AG. Effect of the pre-operative response to H₂ receptor antagonists on the outcome of highly selective vagotomy for duodenal ulcer. *Br J Surg* 1987;74:897-9.

(Accepted 1 December 1987)

Surgical aspects of international drug smuggling

M J R LANCASHIRE, P K LEGG, M LOWE, SUSANNA M DAVIDSON, B W ELLIS

Abstract

The internal concealment of cocaine and other drugs in packets by "body packers"—those who swallow packets of drugs or hide them in their vagina or rectum—to avoid detection by customs officials has been increasing in both the United States and Europe. The types of package and how they are concealed are changing as the traffickers become more sophisticated in their methods. The latest parcels are less likely to burst, but obstruction of the bowel may occur.

Awareness of the problem is important for staff of emergency medical services near international ports of arrival.

Introduction

Since the first report in 1975¹ reports of people smuggling drugs wrapped in packages and concealed either by swallowing or by insertion into the rectum or vagina have increased. Such people have been termed "body packers" or "mules" in America. In the United Kingdom they are referred to by staff of Her Majesty's Customs and Excise as "stuffers and swallowers." Early reports suggested a high mortality; many cases were diagnosed only at postmortem examination.² As the experience of the organisers of the smuggling has increased the packaging has become more sophisticated, and many survivors have now been reported.^{3,4}

Scale of the problem

The number of drug smugglers entering the United Kingdom has increased considerably over the past few years. The United Kingdom and Europe are now considered to be a growing market, as the American market is saturated with drugs and wholesale prices there are falling. Rates of detection have risen not only because of the growing numbers of smugglers but also because of more intelligence and better understanding of the habits of the organisers of the drug trade and methods used for concealing drugs. Sophisticated technology such as sniffer devices and kits of highly sensitive tests for confirming the presence of specific drugs in body fluids or on clothing plays a part in the detection of these crimes.

We analysed data supplied by HM Customs and Excise for September 1986. Of the 56 drug seizures at ports in the United Kingdom, 38 were of heroin (total 13.84 kg), 10 of cannabis (total 1288 kg), and eight of cocaine (total 4.15 kg). In 28 cases the drugs were concealed by swallowing or in the vagina or rectum. Thirty nine of the seizures were made at London Heathrow Airport and 11 at London Gatwick Airport. Other ports used during the month studied were Dover, Ramsgate, Folkestone, Plymouth, and the Scilly Isles. In other months Immingham, Liverpool, Bristol, Sheerness, and Glasgow have been used as ports of entry.

Interpol intelligence suggests that trafficking of cocaine is increasing considerably. In the first nine months of 1986 there were 47 seizures at European airports, amounting to 43 kg cocaine. Most of the 66 Colombians arrested after swallowing drugs were men aged 25-35. They were usually on their first trip to Europe, wearing a new suit and carrying a new Colombian or a forged Spanish or Portuguese passport. The maximum number of packets swallowed was 110; the total weight of cocaine ranged from 500 to 1290 g.

For every smuggler caught unknown numbers evade detection. In a recent exercise customs officers in Madrid made 800 passengers who had aroused their suspicion pass through an x ray machine. Radiological signs compatible with the presence of packets of cocaine in the gastrointestinal tract were seen in 160. We believe that few of these stuffers and swallowers appreciate the risk they take with their lives. Many are from poor backgrounds and are probably regarded by the organisers as expendable.

Interpol intelligence suggests that Colombian traffickers tend to concentrate on smaller European air and sea ports. At present 90% of all seizures of drugs in the United Kingdom take place at the two London airports. We suspect that these figures will change appreciably over the next year or so. Certainly, customs officers at all points of entry to the United Kingdom are now more vigilant. Thus more suspects will probably be taken to more hospitals with suspected perforation, with obstruction, or simply for radiological examination.

Ashford Hospital is close to London Heathrow Airport. We examine about six suspects a month radiologically to try to identify whether they have concealed drugs in their body. The customs officer in charge of the case obtains written permission from the subject before radiographs are taken.

Departments of Surgery and Radiology, Ashford Hospital, Middlesex TW15 3AA

M J R LANCASHIRE, MB, FRCS, surgical registrar
SUSANNA M DAVIDSON, DCH, FRCR, consultant radiologist
B W ELLIS, MB, FRCS, consultant surgeon

Her Majesty's Customs and Excise, Heathrow Airport, Middlesex TW6 1DH

P K LEGG, executive officer
M LOWE, executive officer

Correspondence to: Mr Ellis.

Most suspects have already been examined by a doctor at the airport. The following case report illustrates many of the features and problems that doctors may encounter in managing such patients.

Case report

A 39 year old Colombian man presented to the accident and emergency department. He was in the custody of HM Customs and Excise as he was suspected of having ingested packets of cocaine. He had been picked up because he had taken an unusual route from Colombia to Marseilles via Madrid and London Heathrow. He and an accomplice fitted the criteria noted above defining swallows from Colombia. At the airport a urine test for cocaine yielded a positive result. He complained of nausea but did not have any pain. Results of general, abdominal, and rectal examinations were normal. A plain abdominal radiograph (fig 1) showed many small packages in the abdomen. There were no signs of obstruction.



FIG 1—Plain abdominal x ray film taken on admission. Vague outlines of several opaque packages can be seen in pelvis.

He was admitted for observation and given enemas and sodium picosulphate to encourage the passage of the packages, but only one passed spontaneously. The next day he complained of cramps in his hands. As he might have been absorbing cocaine he was transferred to the intensive care unit, but toxicological examination showed no cocaine in his blood. Forty eight hours after admission he developed colicky pain and distension of the abdomen. Clinical features were consistent with acute obstruction of the small bowel. Another plain radiograph (fig 2) showed multiple fluid levels and was compatible with the physical findings. Several of the packets were seen to have developed gas haloes. At laparotomy the obstruction was found to be due to impaction of one of the packets at the ileocaecal valve. A total of 62 packets of cocaine measuring 2.5×4 cm and cylindrical in shape were found in his gut; 31 were removed from his stomach through a gastrotomy. The 30 packets found in the small bowel and caecum could not be manoeuvred back through the ileocaecal valve and were removed through a caecotomy. He made a good recovery and was discharged back to the care of HM Customs and Excise.

About one third of the packets showed clear evidence of breakdown of the outer wrapping, but all the inner layers were intact. Gas was trapped between the layers, which were discoloured. The white, powdery content was packed so tight that it felt rock hard; it weighed just over 700 g in total (11.2 g/packet). When analysed by HM Chemists it was found to be 80% cocaine. The street value was estimated to be £130 000. The patient had been due to receive \$2000 (about £1250) and would have taken about \$15 000 (about £9500) back to the supplier in Colombia.

On the second day after the operation a man posing as a visitor with flowers managed to get a photograph of the patient and leave the ward before being challenged. The photograph and a story, much of which was factually incorrect, were published a few days later in a Sunday newspaper.³ In ensuing correspondence the editor wrote that, "There must always be occasions when newspapers feel that it is in the public interest to disregard the courtesy of asking permission before entering a hospital ward."

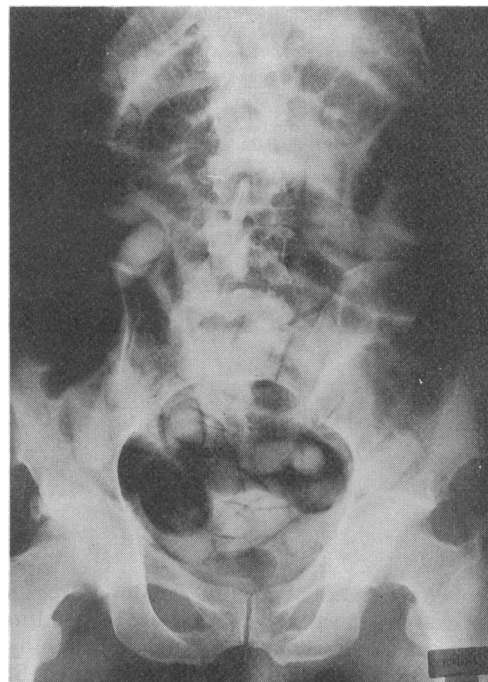


FIG 2—Plain abdominal x ray film taken two days after admission. Small and large bowels are distended, and numerous packages are clearly outlined by gas haloes.

Discussion

The first body packer was reported in 1975.¹ Over half of the body packers reported up to 1981 died.^{2-4,6} Many were found dead in their hotel rooms surrounded by bottles of cathartics, suppositories, and disposable enemas; others presented to casualty departments with the symptoms and signs of cocaine overdose, worried that a package had burst. These early cocaine parcels seemed to rupture rather easily, and some were actually permeable to cocaine.³

Packets of cocaine that can be swallowed contain 3-12 g. The fatal oral dose is in the region of 1-3 g, and in many of the reported deaths only one packet had burst. Up to 182 packets and 1.2 kg cocaine have been found in carriers. Urine testing for cocaine has yielded positive results in many cases, probably because of contamination on the outside of packets when they were swallowed. Symptoms and signs of cocaine toxicity include nausea, vomiting, euphoria, disorientation, behavioural changes, dilated pupils, hypertension or hypotension, tachycardia, respiratory depression, seizures, coma, and death.

McCarron and Wood looked at the packages carried from 1980 to 1982 by 47 patients, none of whom died.⁷ They divided the packages into three types. The first contained loosely packed cocaine powder covered by only two to four layers of condoms or other latex-like material. These packets were round, radio-opaque, and highly susceptible to leakage and rupture. The two other types of package contained tightly packed cocaine powder or paste. One type was well wrapped in multiple layers of tubular latex and often gave the impression of having been packed by machine; there have been no reports of these packages bursting. The third type had a covering of aluminium foil; some of these and some of the first type were said to be radiolucent. Another study showed that over 80% of packages were visible in x ray films.⁸ The packets used more recently were

unlikely to burst, although the outer layer often broke. Obstruction occurred in about 6% of carriers, but conservative management resulted in no deaths.

Scrutiny of a plain abdominal radiograph in people suspected of having swallowed packets of drugs should include a careful search for minimally opaque, regular shaped objects up to 4 cm long. Gas haloes may be seen; in some cases the gas may have been present since the packet was manufactured. In our patient, however, these haloes developed after three days, which suggests that air had leaked into the packages. That the radiological appearance of a packet can change to show a gas halo where none was visible before has not been reported previously and could be an indication for surgical removal of the packets.

We recommend that suspected smugglers brought to hospital should be admitted for observation. A history can often be obtained as once caught many of the swallows are cooperative. The older types of packet should be removed immediately owing to the high risk of rupture.⁸ Examination is rarely rewarding in the early stages,⁷ but signs of toxicity should be looked for and rectal and vaginal examination performed. Radiographs should be taken to confirm the diagnosis and to observe progress. The passage of packets should be encouraged by giving gentle laxatives and enemas⁸; stronger cathartics may promote obstruction and rupture. Endoscopy is contraindicated as it may break the packets.⁴ Operation is indicated if obstruction occurs or if the packages being passed per rectum show signs of breaking up. If a packet ruptures and the

patient does not die immediately operation should be considered once the patient has been resuscitated. Multiple incisions into the intestine may be required as the packages are usually widely dispersed in the gut. Packets are most commonly retained in the stomach and distal ileum and at the ileocaecal valve and splenic flexure.^{7,8}

Surgeons, physicians, medical officers, and all medical staff with responsibility for air or sea ports should be aware of this problem, which has not previously been identified in medical reports in Britain. Most patients can be managed conservatively, but high risk patients and complications must be dealt with expeditiously.

References

- 1 Mebanex C, DeVito J. Cocaine intoxication—a unique case. *J Fla Med Assoc* 1975;62:19-20.
- 2 Wetli CV, Mittleman RE. The "body packer syndrome"—toxicity following ingestion of illicit drugs packaged for transportation. *J Forensic Sci* 1981;26:492-500.
- 3 Dobbie P. The man who proves Mellor drug mission isn't working. *Mail on Sunday* 1986;Oct 26.
- 4 Suarez C, Arango A, Lester JL. Cocaine-condom ingestion—surgical treatment. *JAMA* 1977;238:1391-2.
- 5 Sinner WN. The gastrointestinal tract as a vehicle for drug smuggling. *Gastrointest Radiol* 1981;6:319-23.
- 6 Freed TA, Sweet LN, Gauder PJ. Balloon obturation bowel obstruction: a hazard of drug smuggling. *AJR* 1976;127:1033-4.
- 7 McCarron MM, Wood JD. The cocaine "body packer" syndrome—diagnosis and treatment. *JAMA* 1983;250:1417-20.
- 8 Caruana DS, Weinbach B, Goerg D, Gardner LB. Cocaine-packet ingestion. *Ann Intern Med* 1984;100:73-4.

(Accepted 25 November 1987)

SHORT REPORTS

Adiposity and food intake in young children: the environmental challenge to individual susceptibility

We have recently investigated an apparent contradiction in studies of obesity¹: obese people do not eat more than their peers^{2,3} but there is a higher prevalence of obesity in populations who have a higher intake of food.⁴ In this study the food intake and corpulence of children aged 1-3 were examined on the basis of both an individual risk factor (degree of adiposity) and an environmental factor (social group with a particular level of energy intake).

Subjects, methods, and results

We studied 727 children aged 1-3 years. Anthropometric measurements were made by paediatricians and food was weighed and five day intakes recorded by the mothers according to instructions given by dietitians. The children were stratified into five groups of corpulence based on their body mass index (weight (kg)/height (m)²; see figure). Cut off points were the 5th, 15th, 85th, and 95th centiles

of the Z scored distribution. The children were further stratified according to the father's occupation—namely, unskilled, semiskilled, or skilled (group 1) and professional or managerial (group 2). Of the children in group 1, 237 were 12-24 months old and 208 24-36 months old, and of those in group 2, 168 were 12-24 months old and 114 24-36 months old.

Total daily energy intake expressed in MJ and MJ/m height did not vary significantly with corpulence ($p=0.88$ and $p=0.73$ respectively). Furthermore, there was no relation between corpulence and the intake of particular foods. Children in group 1, however, had a higher daily energy intake than those in group 2 (5.46 (SD 1.27) MJ *v* 5.20 (SD 1.12) MJ; $F(1, 727)=7.2$; $p=0.007$).

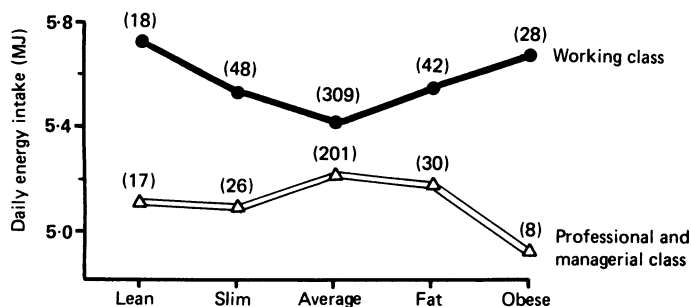
The figure shows energy intake as a function of corpulence in each socioeconomic group. In children from group 2 food intake was clearly lower at all levels of corpulence. Within each socioeconomic group energy intake did not differ significantly with level of corpulence (group 2: $F(4, 277)=0.31$, $p=0.87$; group 1: $F(4, 440)=0.70$, $p=0.59$). Obesity (body mass index over the 95th centile) was recorded in 8 (2.8%) children in group 2 and 28 (6.3%) children in group 1 ($p=0.01$).

Comment

These results replicate our earlier findings in 7-12 year olds¹ and repeat the apparent contradiction in studies of obesity—that is, (a) the average daily energy intake showed no significant difference among groups with different degrees of adiposity; and (b) the average daily energy intake differed between social groups and there were more obese children among the population with a higher intake of energy.

Studies of disorders related to diet, such as obesity and energy intake,¹ coronary heart disease and fat,² and hypertension and salt,³ may reach different (or even opposite) conclusions depending on the types of comparisons that are made; for example, case-control studies and population comparison studies may include subjects who are selected on different bases. In our first approach, as in case-control studies, the groups were constituted on the basis of adaptive success or failure (probably dependent on constitutional susceptibility), which does not imply normal or aberrant behaviour; the results prominently reflect constitutional differences. Our second approach was a comparison of populations who differed in some critical aspect of lifestyle, regardless of individual predispositions. Such comparisons typically show a direct relation between dietary intake and the prevalence of risk factors in the populations.

The contrasting results obtained from comparisons of randomly selected populations and case-control studies evokes the difficulty of using statistical norms in the physician's office. Health recommendations are based on large



Relation between corpulence (based on body mass index (kg/m²)) and energy intake in two socioeconomic groups (as defined by father's occupation). Energy intake differed significantly ($p=0.007$) between the two groups. There was no significant difference in energy intake with level of corpulence within each socioeconomic group (Numbers of children given in parentheses.)